The invention claimed is:

1. A process for removal of sulfur from a full boiling range fluid cracked naphtha stream comprising the steps of:

(a) feeding hydrogen and a full boiling range naphtha feed containing olefins, diolefins, mercaptans, thiophene and other organic sulfur compounds to a

(b) concurrently in said first distillation column reactor

(i) reacting a portion of the mercaptans contained within said full boiling range naphtha stream with a portion of the diolefins contained within said full boiling range naphtha stream to produce sulfides and

(ii) separating said full boiling range naphtha stream into three fractions by fractional distillation;

(c) removing a first liquid product from said first distillation column reactor comprising a light naphtha containing substantially no mercaptans, sulfides or other organic sulfur compounds as a first overheads;

(d) removing an intermediate naphtha as a side draw from said distillation column reactor containing thiophene, diolefins boiling in the range of thiophene and mercaptans boiling in the range of thiophene;

(e) removing a heavy naphtha from said first distillation column reactor containing said sulfides and other organic sulfur compounds as a first bottoms;

(f) feeding said intermediate naphtha and a low sulfur, low olefin gas oil to a single pass fixed bed reactor containing a hydrodesulfurization catalyst where substantially all of any remaining sulfides and other organic sulfur compounds are reacted with hydrogen to form hydrogen sulfide.

2. A process for removal of sulfur from a full boiling range fluid cracked naphtha stream comprising the steps of:

(a) feeding hydrogen and a full boiling range naphtha feed containing olefins, diolefins, mercaptans, thiophene and other organic sulfur compounds to a first distillation column reactor containing a bed of thioetherification catalyst;

(b) concurrently in said first distillation column reactor

(i) reacting a portion of the mercaptans contained within said full boiling range naphtha stream with a portion of the diolefins contained within said full boiling range naphtha stream to produce sulfides and

(ii) separating said full boiling range naphtha stream into three fractions by fractional distillation;

(c) removing a first liquid product from said first distillation column reactor comprising a light naphtha containing substantially no mercaptans, sulfides or other organic sulfur compounds as a first overheads;

(d) removing an intermediate naphtha as a side draw from said distillation column reactor containing thiophene, diolefins boiling in the range of thiophene and mercaptans boiling in the range of thiophene;

(e) removing a heavy naphtha from said first distillation column reactor containing said sulfides and other organic sulfur compounds as a first bottoms;

(f) feeding said intermediate stream and hydrogen to a distillation column where a portion of said intermediate stream is taken as overheads and returned to said distillation column reactor; and

(g) feeding the bottoms from said distillation column and a low sulfur, low olefin gas oil to a single pass fixed bed reactor containing a hydrodesulfurization catalyst where substantially all of any remaining sulfides and other organic sulfur compounds are reacted with hydrogen to form hydrogen sulfide.

3. A process for removal of sulfur from a full boiling range fluid cracked naphtha stream comprising the steps of:

(a) feeding hydrogen and a full boiling range naphtha feed containing olefins, diolefins, mercaptans, thiophene and other organic sulfur compounds to a first distillation column reactor containing a bed of thioetherification catalyst;

(b) concurrently in said first distillation column reactor

(i) reacting a portion of the mercaptans contained within said full boiling range naphtha stream with a portion of the diolefins contained within said full boiling range naphtha stream to produce sulfides and

(ii) separating said full boiling range naphtha stream into three fractions by fractional distillation;

(c) removing a first liquid product from said first distillation column reactor comprising a light naphtha containing substantially no mercaptans, sulfides or other organic sulfur compounds as a first overheads;

(d) removing an intermediate naphtha as a side draw from said distillation column reactor containing thiophene, diolefins boiling in the range of thiophene and mercaptans boiling in the range of thiophene;

(e) removing a heavy naphtha from said first distillation column reactor containing said sulfides and other organic sulfur compounds as a first bottoms;

(f) feeding said intermediate stream and hydrogen to a second distillation column reactor containing a hydrogenation catalyst;

and

(g) feeding the bottoms from said second distillation column reactor and a low suflur, low olefin gas oil to a single pass fixed bed reactor containing a hydrodesulfurization catalyst where substantially all of any remaining sulfides and other organic sulfur compounds are reacted with hydrogen to form hydrogen sulfide.

4. The process according to claim 3 wherein the effluent from single pass fixed bed reactor is fed to a vessel wherein the H_2S is removed as a vapor to form a third liquid product.

5. The process according to claim 3 wherein said thioetherification catalyst comprises palladium supported on an alumina base.

6. The process according to claim 3 wherein said hydrodesulfurization catalyst comprises the oxides of a Group VIB or Group VIII supported on an alumina base.

7. The process according to claim 6 wherein said catalyst comprises the oxides of cobalt and molybdenum supported on an alumina base.

8. The process according to claim 6 wherein said catalyst comprises the oxides of nickel and molybdenum supported on an alumina base.

9. The process according to claim 6 wherein said catalyst comprises the oxides of nickel and tungsten supported on an alumina base.

10. The process according to claim 7 wherein said oxides are converted to sulfides prior to feeding said full boiling range naphtha feed.

11. A process for removal of sulfur from a full boiling range fluid cracked naphtha stream comprising the steps of:

(a) feeding hydrogen and a full boiling range naphtha feed containing

olefins, diolefins, mercaptans, thiophene and other organic sulfur compounds to a first distillation column reactor containing at least one bed of thioetherification catalyst and at least one bed of hydrogenation catalyst;

(b) concurrently in said first distillation column reactor

(i) reacting a portion of the mercaptans contained within said full boiling range naphtha stream with a portion of the diolefins contained within said full boiling range naphtha stream to produce sulfides in said bed of thioetherification catalyst,

(ii) reacting a portion of the diolefins contained with said full boiling range naphtha stream with hydrogen in said bed of hydrogenation catalyst to selectively hydrogenate said diolefins to mono olefins, and

(ii) separating said full boiling range naphtha stream into three fractions by fractional distillation;

(c) removing a first liquid product from said first distillation column reactor comprising a light naphtha containing substantially no mercaptans, sulfides or other organic sulfur compounds as a first overheads;

(d) removing an intermediate naphtha as a side draw from said distillation column reactor containing thiophene, diolefins boiling in the range of thiophene and mercaptans boiling in the range of thiophene;

(e) removing a heavy naphtha from said first distillation column reactor containing said sulfides and other organic sulfur compounds as a first bottoms;

(f) treating said first bottoms to remove organic sulfur compounds;

(g) feeding said intermediate stream and hydrogen to a second distillation column reactor containing a hydrogenation catalyst;

(h) concurrently in said second distillation column reactor:

(i) reacting a portion of the diolefins contained within said intermediate stream with hydrogen to selectively hydrogenate said diolefins and

(ii) separating said intermediate stream into a second overheads and second bottoms by fractional distillation;

(i) returning said second overheads to said first distillation column reactor;

(j) feeding said second bottoms, a low sulfur gas oil and hydrogen to a single pass fixed bed reactor containing a hydrodesulfurization catalyst where

substantially all of the thiophenes contained within said second bottoms are reacted with hydrogen to form hydrogen sulfide;

12. The process according to claim 11 comprising:

(k) feeding the effluent to a distillation column wherein said second bottoms are separated as a second side stream from said hydrogen sulfide which is removed as a third overheads and said low sulfur gas oil which is removed as a third bottoms;

(l) feeding said second side stream from to a vessel wherein the H_2S is removed as a vapor which is returned to said distillation column; and

(m) recycling said third bottoms to said single pass fixed bed reactor.